

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Spectrum Policy:	)	
	)	
Solicitation of Public Comment	)	ET Docket No. 02-135
by the Spectrum Policy Task Force	)	
	)	
	)	
To: The Commission	)	

**COMMENTS OF  
Statewide Wireless Network  
New York State Office for Technology  
6C Executive Park Dr.  
Albany, NY 12203-3716**

July 8, 2002

# Appendix 7

Cover Letter, and Slides presented to the  
FCC Public Safety National Coordination Committee  
meeting in San Francisco, CA on January 28, 2000



JAMES W. MCMAHON  
SUPERINTENDENT

STATE OF NEW YORK  
NEW YORK STATE POLICE  
BUILDING 22  
1220 WASHINGTON AVENUE  
ALBANY, NEW YORK 12226-2252

April 3, 2000

Ms. Kathleen Wallman  
Wallman Strategic Consulting, LLC  
555 12<sup>th</sup> Street, NW  
Washington, DC 20004

Dear Ms. Wallman:

At the January 28, 2000, meeting of the Federal Communications Commission's Public Safety National Coordination Committee, held at City Hall in San Francisco, California, I was given the opportunity to present slides which illustrate the adverse impact of the proposed Canadian Digital Television Allotment Plan upon Public Safety users of the 764-776 / 794-806 MHz band. Enclosed is a printed copy of that presentation.

To provide you with further information regarding the adverse impact of this situation, but not to burden you with additional paper, I recommend that you review the material publicly available on the Internet web site of Hammett and Edison, Consulting Engineers, at <<http://www.h-e.com>>. A copy of the items to review on their home page is enclosed. Chief among these is the November 15, 1999 draft Letter of Understanding between Industry Canada and the Federal Communications Commission, along with all of its appendices. This document excludes Public Safety along the border from any rights to the 700 MHz Public Safety band. You will note that the broadcasting group they represent also has problems with this plan. That report explains where they obtained a copy of the draft Letter of Understanding.

Last Friday we met with Public Safety representatives of Washington State agencies, the City of Seattle, the City of Portland Oregon and Washington County, Oregon - already well known for their interference problem with NEXTEL. We discussed the impact of this problem upon them, and they are also very concerned, even though they would have a much lower number of DTV allotments to impact them, it directly affects their major population areas along the coast.

A review of the entire US border with Canada reveals that there is an extreme concentration of adversely impacting DTV allotments in the Northeast. The Canadian Allotment Plan is totally unsatisfactory to New York State and will seriously impact the other Northeast border States from Maine to Michigan, along with Washington and Oregon.

Ms. Kathleen Wallman  
April 3, 2000  
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As the Committee Chair and Chief Spokesperson for Public Safety in the United States, we seek your assistance in guiding the Commission toward a more appropriate international agreement that will not diminish Public Safety use of this Congressionally mandated spectrum relief.

If you should have any questions, please do not hesitate to contact me at (518) 457-9478.

Sincerely,

Robert F. Schlieman  
Radio Engineer  
New York State Police

Encl. (2)

C: NCC Members

Douglas M. Aiken  
Clarence Harmon  
Ernest Hofmeister  
Harlin R. McEwen  
Timothy Loewenstein  
Julio Murphy  
Ellen O'Hara  
Stephen Proctor  
Louise Renne  
Marilyn Ward  
Designated Federal Officer  
Michael Wilhelm

**Available From Hammett & Edison web site**  
**<<http://www.h-e.com/logo.html>>:**

- |                              |  |
|------------------------------|--|
| <b>February 7, 2000</b>      | <b>Preliminary evaluation of Canadian DTV Letter of Understanding. [2548 kB]</b>                       |
| <b>January 17, 2000</b>      | <b>List of Canadian DTV allotments short-spaced to U.S. NTSC stations and DTV allotments. [389 kB]</b> |
| <b>&gt; January 12, 2000</b> | <b>Canadian DTV Agreement *<br/>(not yet ratified) [712 kB]</b>  |

**\* = Nov. 15, 1999 Draft Letter of Understanding,  
Includes All Appendices**

**The Following slides were  
presented to the FCC Public Safety  
National Coordination Committee at  
their San Francisco meeting on  
January 28, 2000.**

**Robert F. Schlieman  
New York State Police  
1220 Washington Avenue - Bldg 22  
Albany, New York 12226-2252  
Telephone: (518) 457-9478**

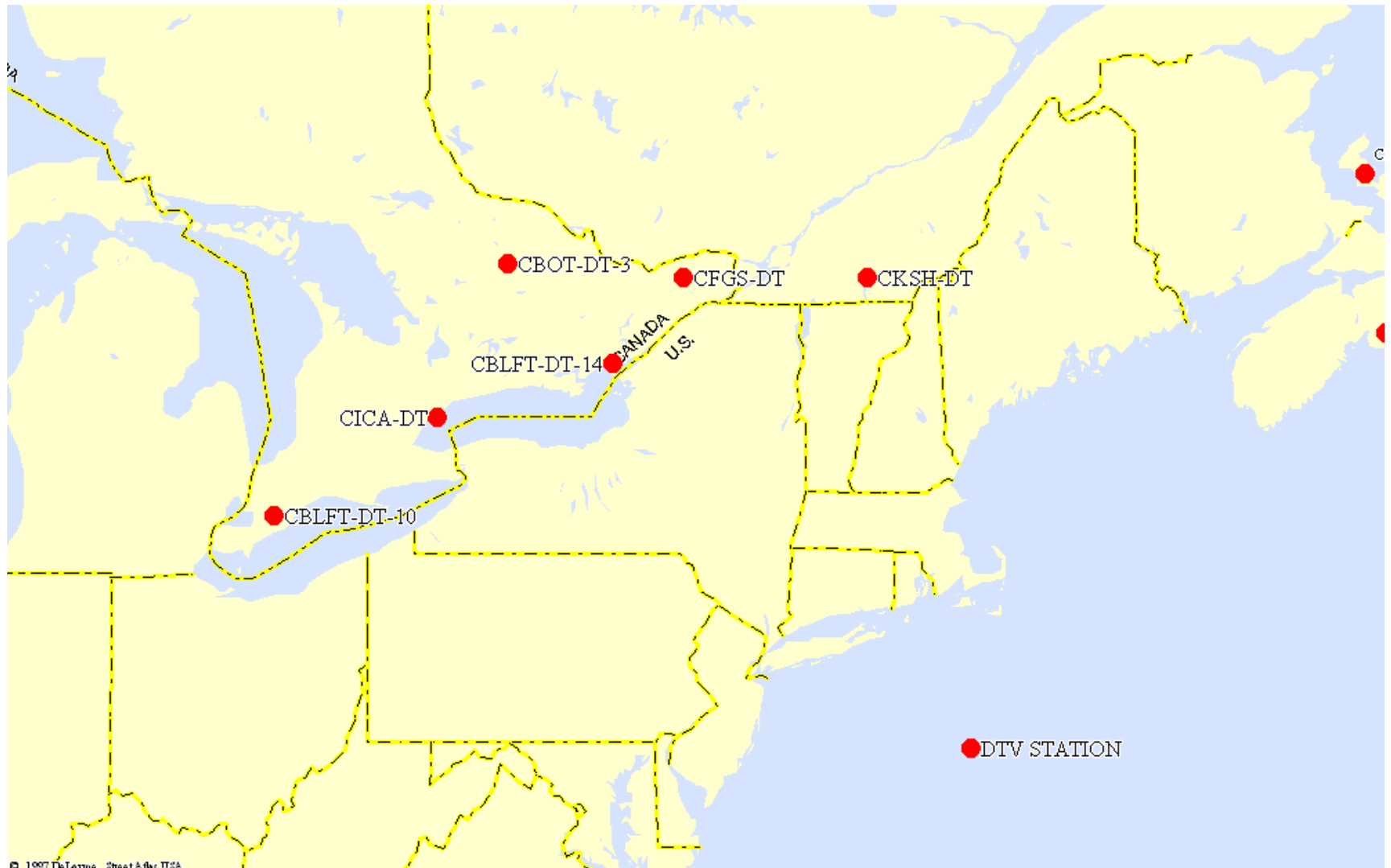
**Impact of the current Canadian  
Digital Television Transition  
Allotment Plan,  
Issue 2, April 1999,  
upon United States Public Safety  
use of the 764-776/794-806 MHz  
band in the New York State area.  
TV channels  
62, 63, 64, 65, 67, 68 and 69**

**Robert F. Schlieman, NYSP  
Presented at the PSWN Symposium in Lansing, Michigan  
September 23, 1999**

# Channel 62



# Channel 63





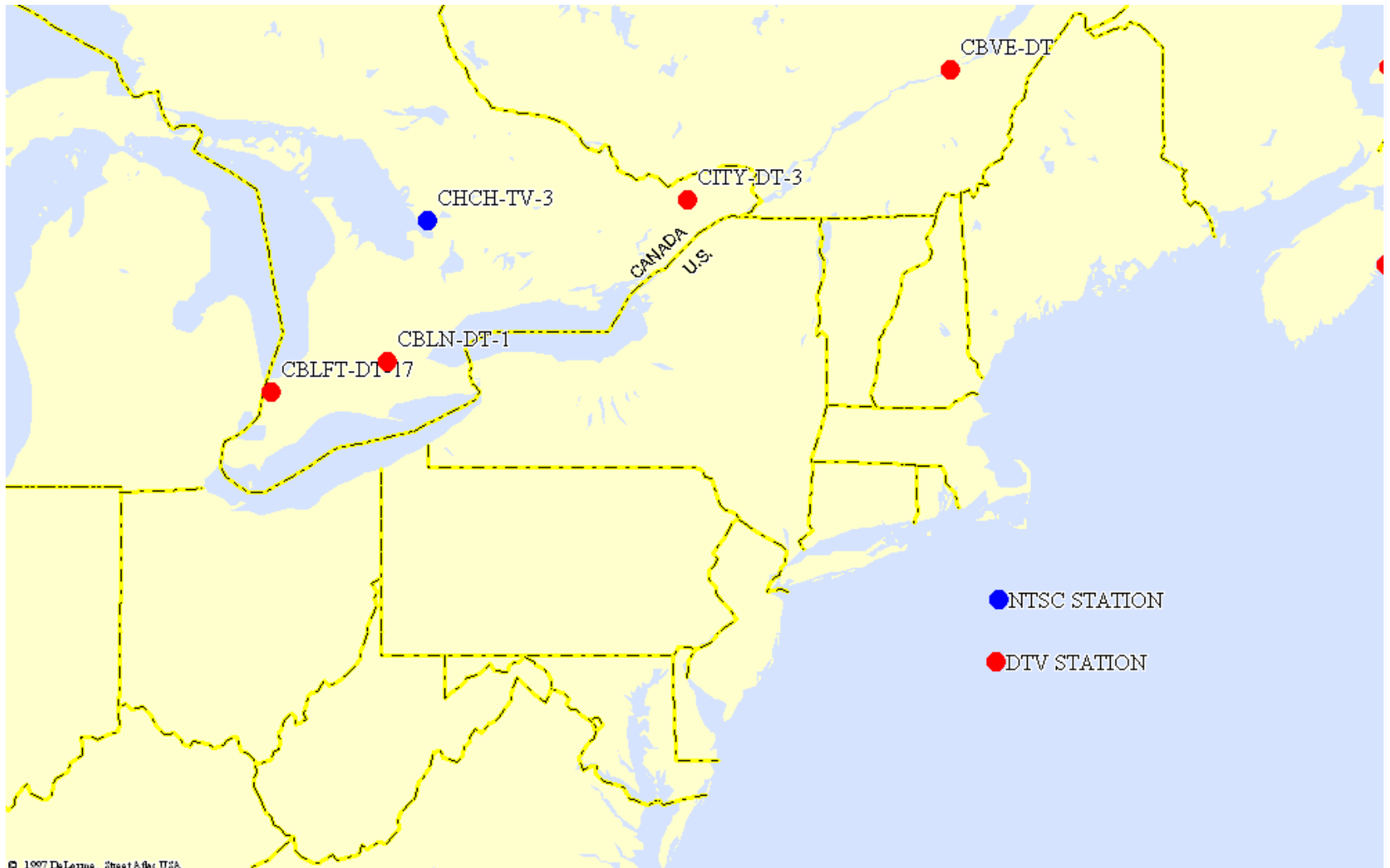
# Channel 64



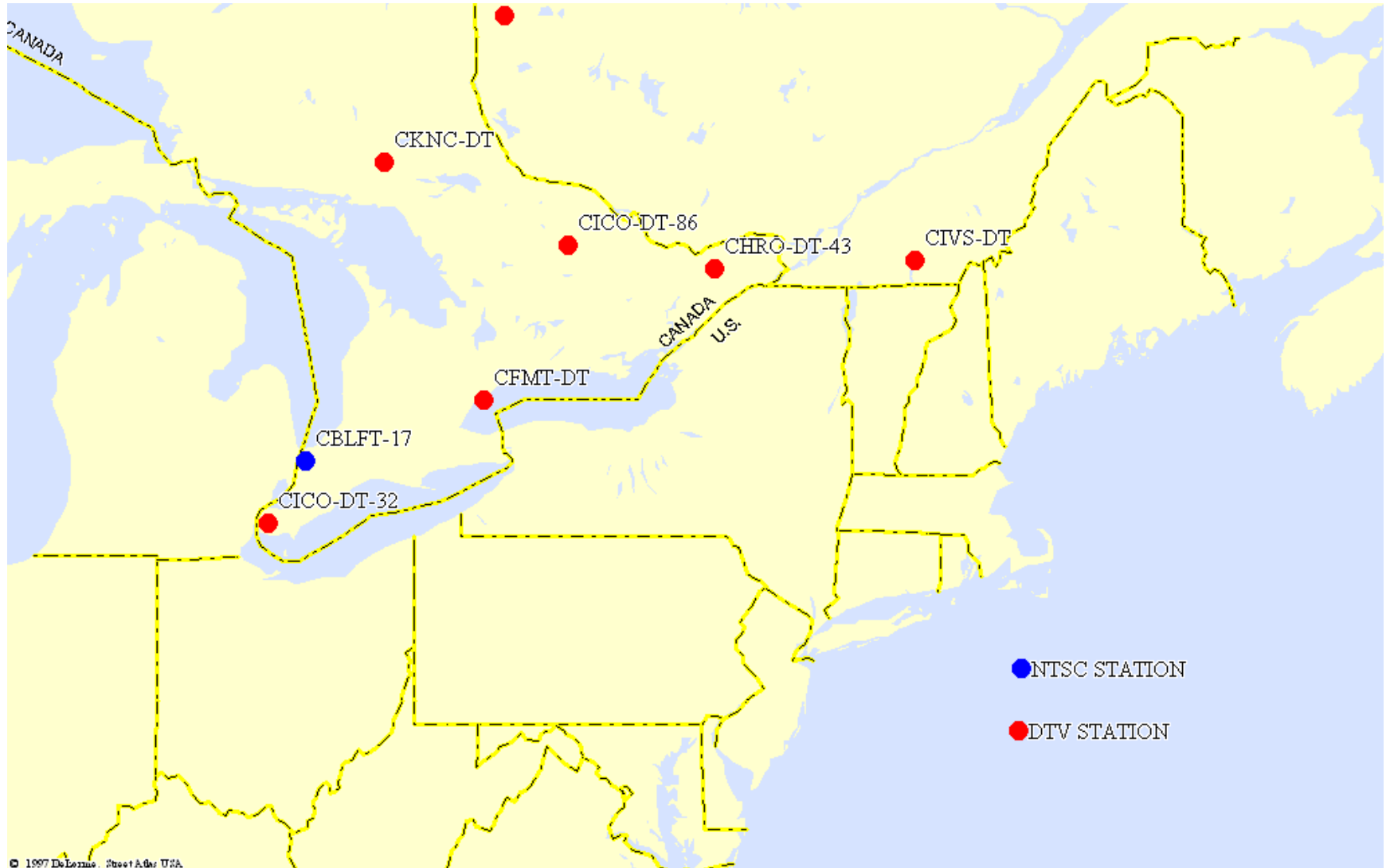
# Channel 65



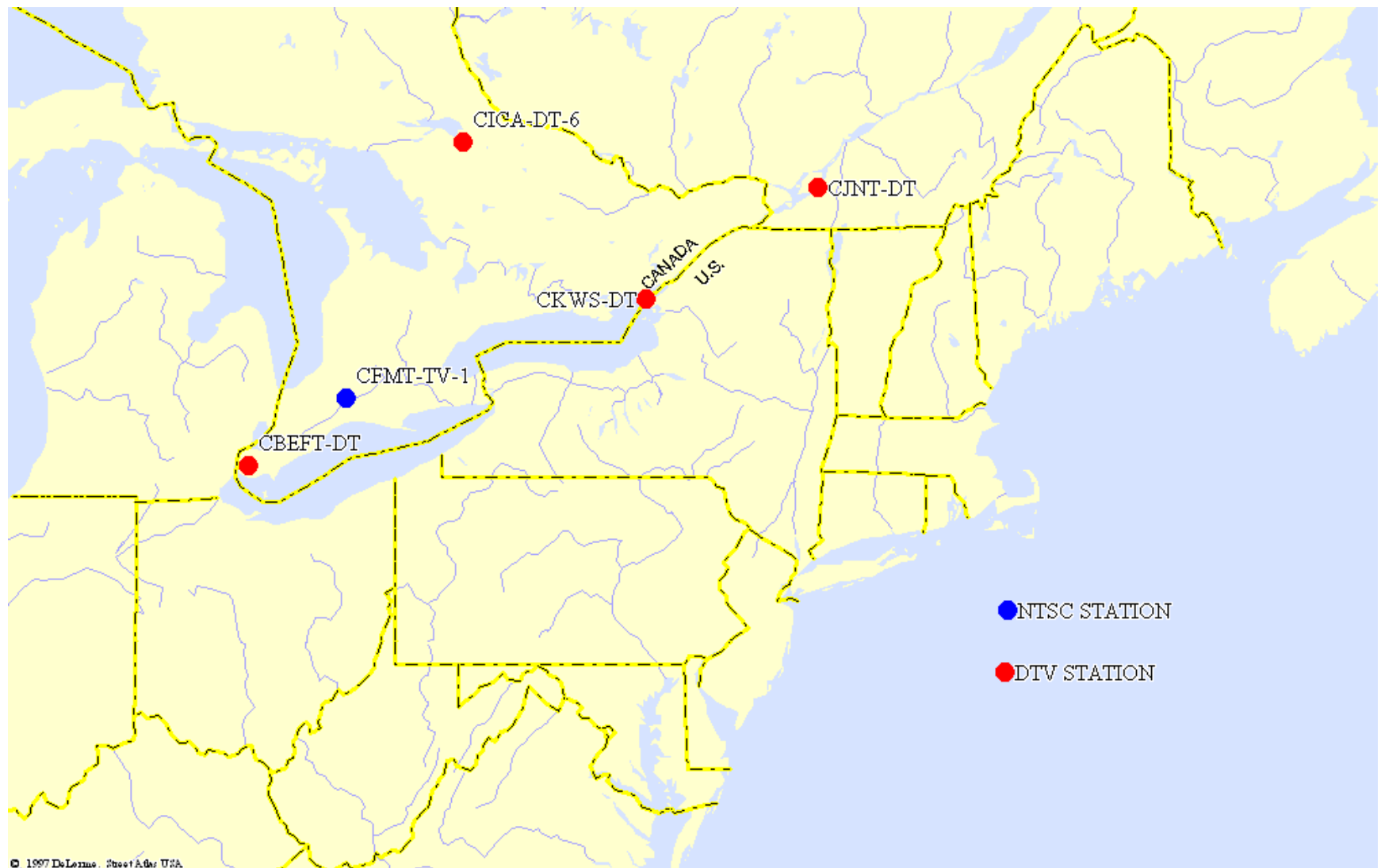
# Channel 67



# Channel 68



# Channel 69



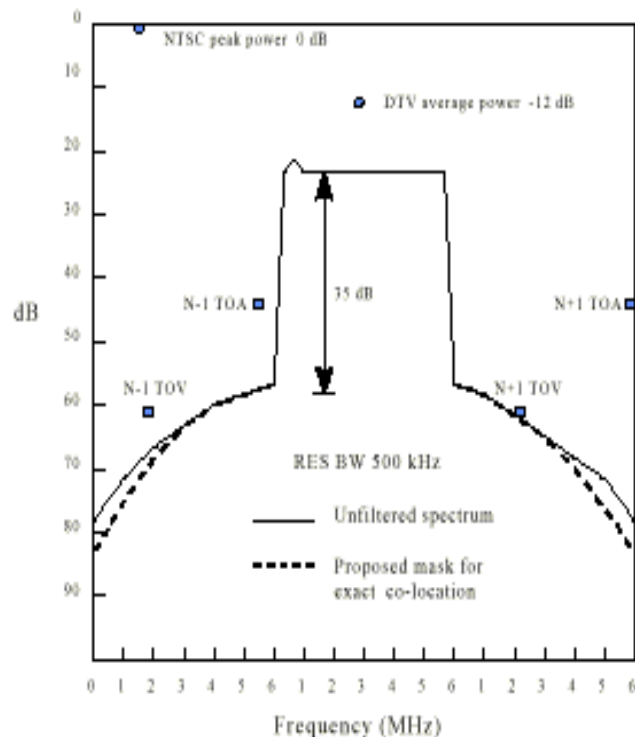


Figure 1: Unfiltered DTV spectrum and proposed "loose-mask" for exact co-location

Due to the essentially even power distribution of the DTV signal, interfering power into a narrow band channel is assumed to be the ratio of the respective bandwidths.  
 (i.e.  $25 \text{ kHz} / 6 \text{ MHz} = 1/240$   
 $= -23.8 \text{ dB}$ )

{ 25 kHz was selected for NYS consideration of a 4-slot TDMA system application. However, it is acknowledged that Adjacent and Co-Channel LMR receiver thresholds (sensitivity and digital to digital interference.) used in this depiction are actually for 12.5 kHz Project 25 digital radios.  
 Ref: NTIA Report 99-358}

## How Canadian DTV ERP was approximated

- NTSC parameters are available from the Canadian database.
- The distance to the Grade B contour was found by using the NTSC parameters in conjunction with the  $F(50,50)$  curves.
- At the new DTV frequency, the ERP was varied by trial and error until that same Grade B distance was replicated using  $F(50,90)$  curves at the reduced DTV receiver sensitivity level. (As specified in the Canadian publication “Digital Television Service Considerations and Allotment Principles” Prepared by JTCAB Ad Hoc Group on DTV Planning Parameters, August 1997.)
- The circular line about individual sites represents its Grade B Contour.

# Power Thresholds

## DTV Co-channel at base receive, antenna 50 m above ground

-121.4 dBm	Sensitivity at 5% BER
- 5.0 dB	Tower-top LNA noise figure improvement
- 10.0 dB	Antenna gain
- (-23.8) dB	6 MHz to 25 kHz power reduction
- 3.6 dB	10% interference fade increase
- 14.4 dB	Co-channel interference rejection ratio *

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**-130.6 dBm**

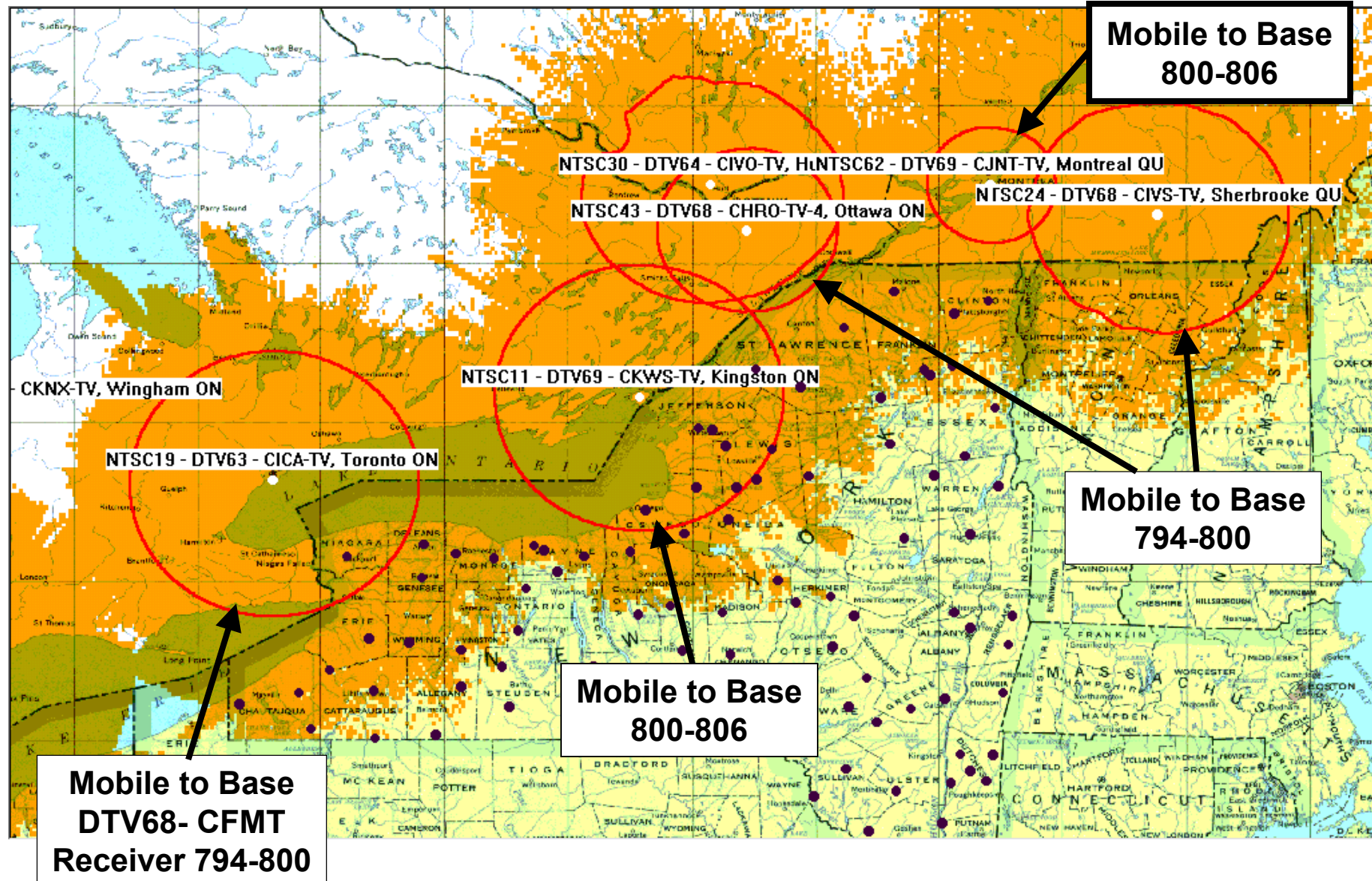
**Tower Receive Interference Threshold**

\* (P interferer - P desired) dB - NTIA 99-358 Table 3.

The following plots show Longley Rice prediction of signal strength.



# Canadian DTV Co-channel at Towers (50 m) -130.6 dBm



**While the ultimate channel plan is for base stations to receive on 794-806 (TV 68-69), the initial implementation may, for good cause shown, be different initially. [ref: 47 CFR 90.531(e)]**

**Therefore, any of these transmitters could have an impact upon base station receivers.**

**Several Canadian cities have multiple DTV channels proposed. The coverage plots shown above are reasonable representations of their impact upon U.S. public safety LMR use.**

**63 : Kingston, Toronto, Hull  
(Also, Chatham - affects Michigan)**

**64 : Kingston, Toronto, Hull**

**68 : Ottawa, Toronto, Sherbrooke  
(Also, Windsor - affects Michigan)**

**69 : Kingston, Montreal  
(Also, Windsor - affects Michigan)**

# Power Thresholds

## DTV Co-channel at mobile receive, antenna 2.2 m above ground

-121.4 dBm	Sensitivity at 5% BER
- 3.0 dB	Antenna gain
- (-23.8) dB	6 MHz to 25 kHz power reduction
- 3.6 dB	10% interference fade increase
- 14.4 dB	Co-channel interference rejection ratio *

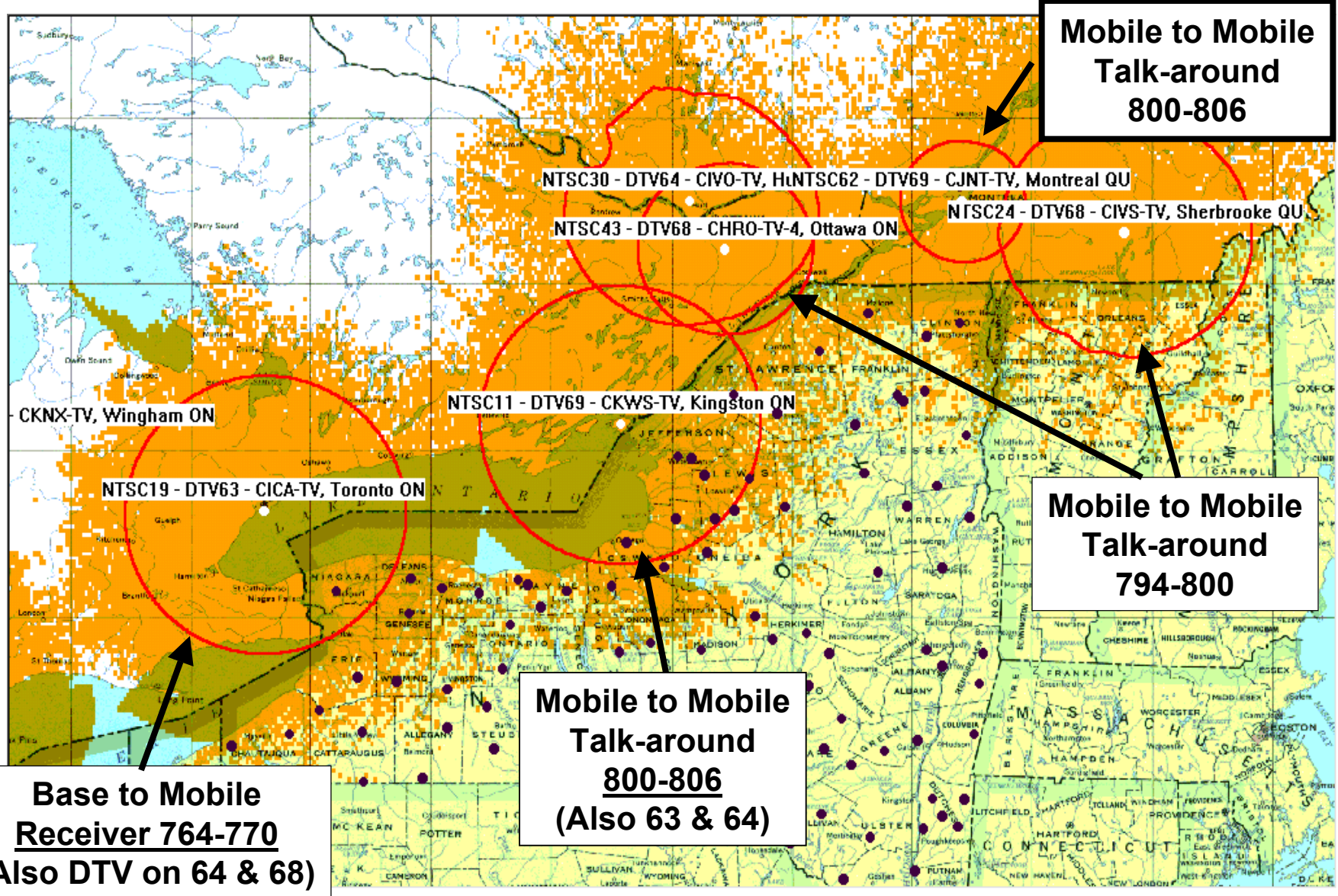
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**-118.6 dBm**

**Mobile Receive Interference Threshold**

\* (P interferer - P desired) dB      -      NTIA 99-358 Table 3.

# Canadian DTV Co-channel at Mobiles (2.2 m) -118.6 dBm





- An emission mask may be employed to prevent interference to Canadian DTV receivers from adjacent channel DTV/NTSC transmitters.
- The need for an emission mask is a function of whether the transmitters are co-located or distant from each other.
  - Co-located or distant adjacent channel DTV transmitters do not require an emission mask.
  - Co-located DTV/NTSC transmitters require only a loose mask.
  - Distant (up to 5 miles) spaced DTV/NTSC transmitters require a tight mask.
- **In our adjacent channel analysis, we did not assume use of an emission mask.**
- **Two adjacent channel cases were examined:**
  - **close freq. spacing to adj-channel (-35 dB)**
  - **far freq. spacing to adj-channel (-55 dB)**

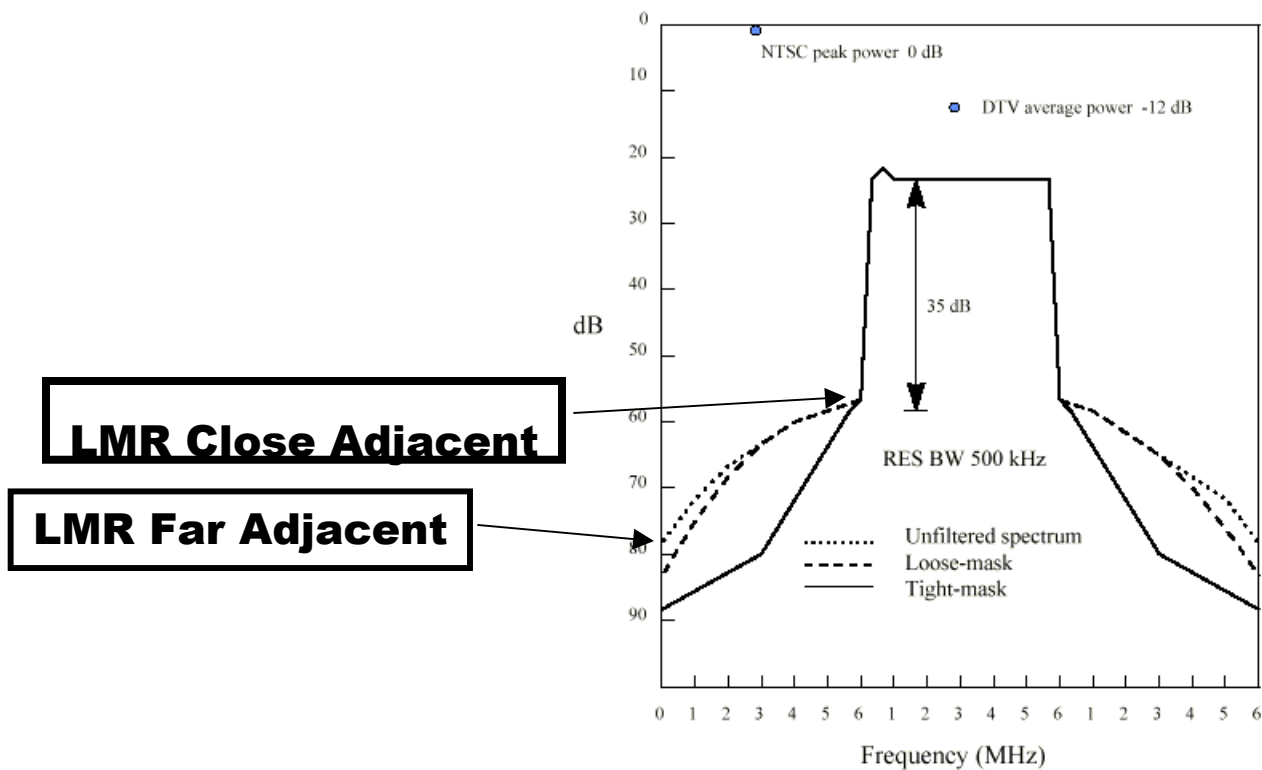


Figure 5: Proposed emission masks

Appendix 3  
DIGITAL TELEVISION  
Service Considerations and Allotment Principles  
Prepared by  
JTCAB Ad Hoc Group on DTV Planning Parameters  
August 1997

# Power Thresholds

## DTV Adjacent channel at base receive, antenna 50 m above ground

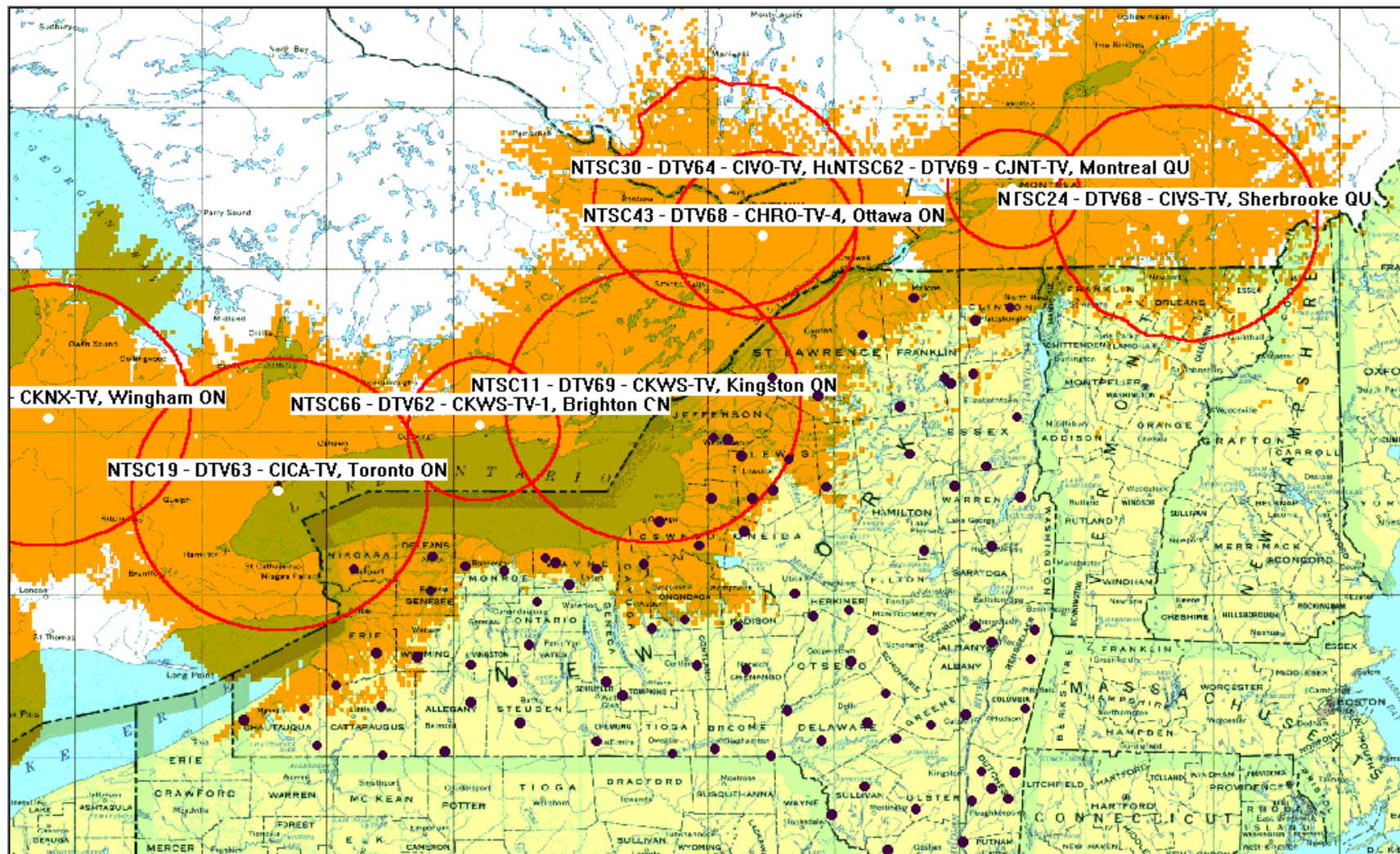
-121.4 dBm	Sensitivity at 5% BER
- 5.0 dB	Tower-top LNA noise figure improvement
- 10.0 dB	Antenna gain
- (-23.8) dB	6 MHz to 25 kHz power reduction
- 3.6 dB	10% interference fade increase
- (- 35.0) dB	<u>Close</u> sideband noise level
- 14.4 dB	Co-channel interference rejection ratio *
- 95.2 dBm	<b>Tower Receive Interference Threshold</b>

\* (P interferer - P desired) dB - NTIA 99-358 Table 3.

The Co-channel interferer is the sideband noise of the adjacent channel DTV signal.

# Canadian DTV

## Close Adj-Channel at Towers (50 m) -95.2 dBm





# Power Thresholds

## DTV Adjacent channel at base receive, antenna 50 m above ground

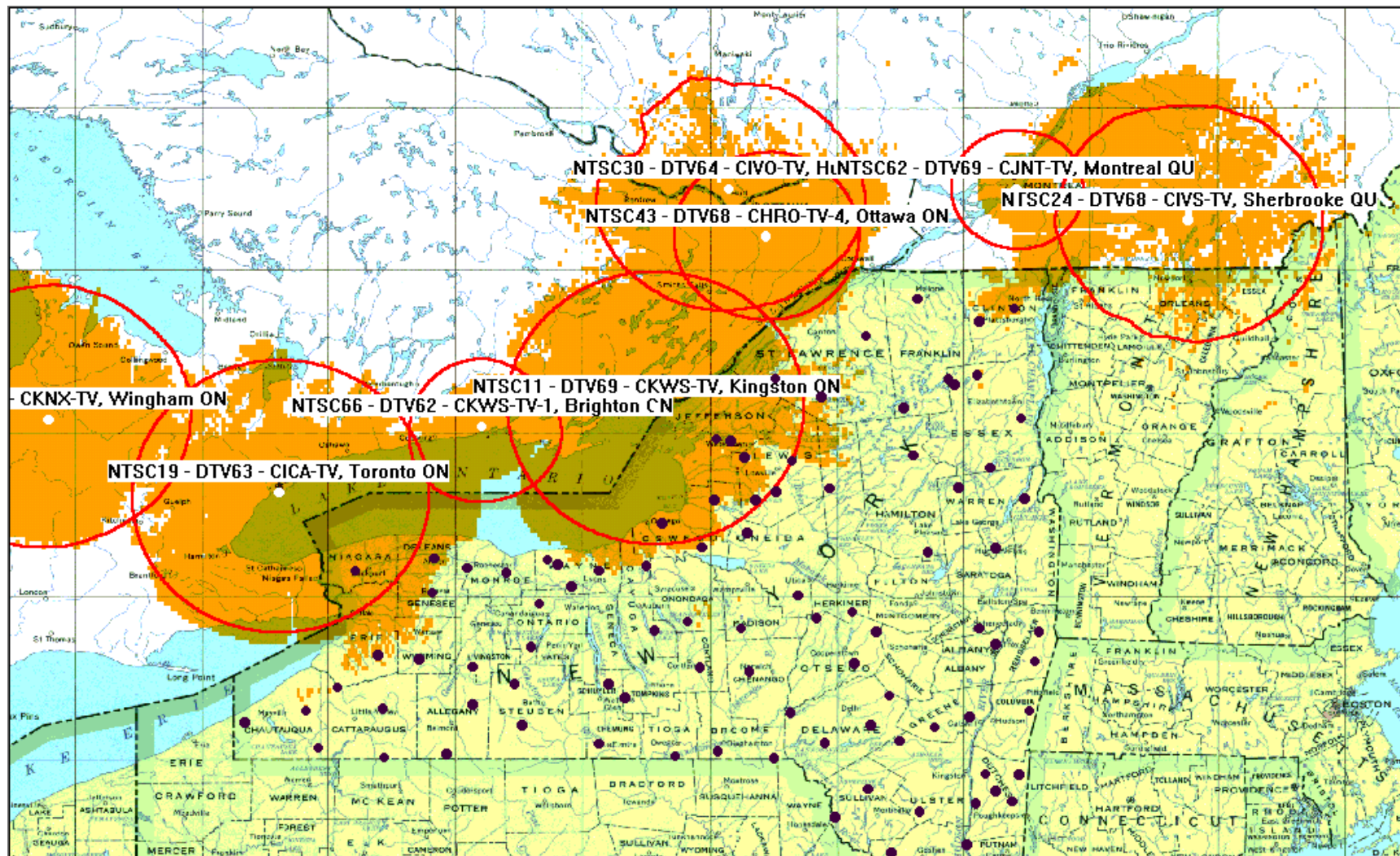
-121.4 dBm	Sensitivity at 5% BER
- 5.0 dB	Tower-top LNA noise figure improvement
- 10.0 dB	Antenna gain
- (-23.8) dB	6 MHz to 25 kHz power reduction
- 3.6 dB	10% interference fade increase
- (-55.0) dB	<b><u>Far</u></b> sideband noise level
- 14.4 dB	Co-channel interference rejection ratio *
<b>- 75.6 dBm</b>	<b>Tower Receive Interference Threshold</b>

\* (P interferer - P desired) dB - NTIA 99-358 Table 3.

The Co-channel interferer is the sideband noise of the adjacent channel DTV signal.

# Canadian DTV

## Far Adj-channel at Towers (50 m) -75.6 dBm



# Power Thresholds

## DTV Adjacent channel at mobile receive, antenna 2.2 m above ground

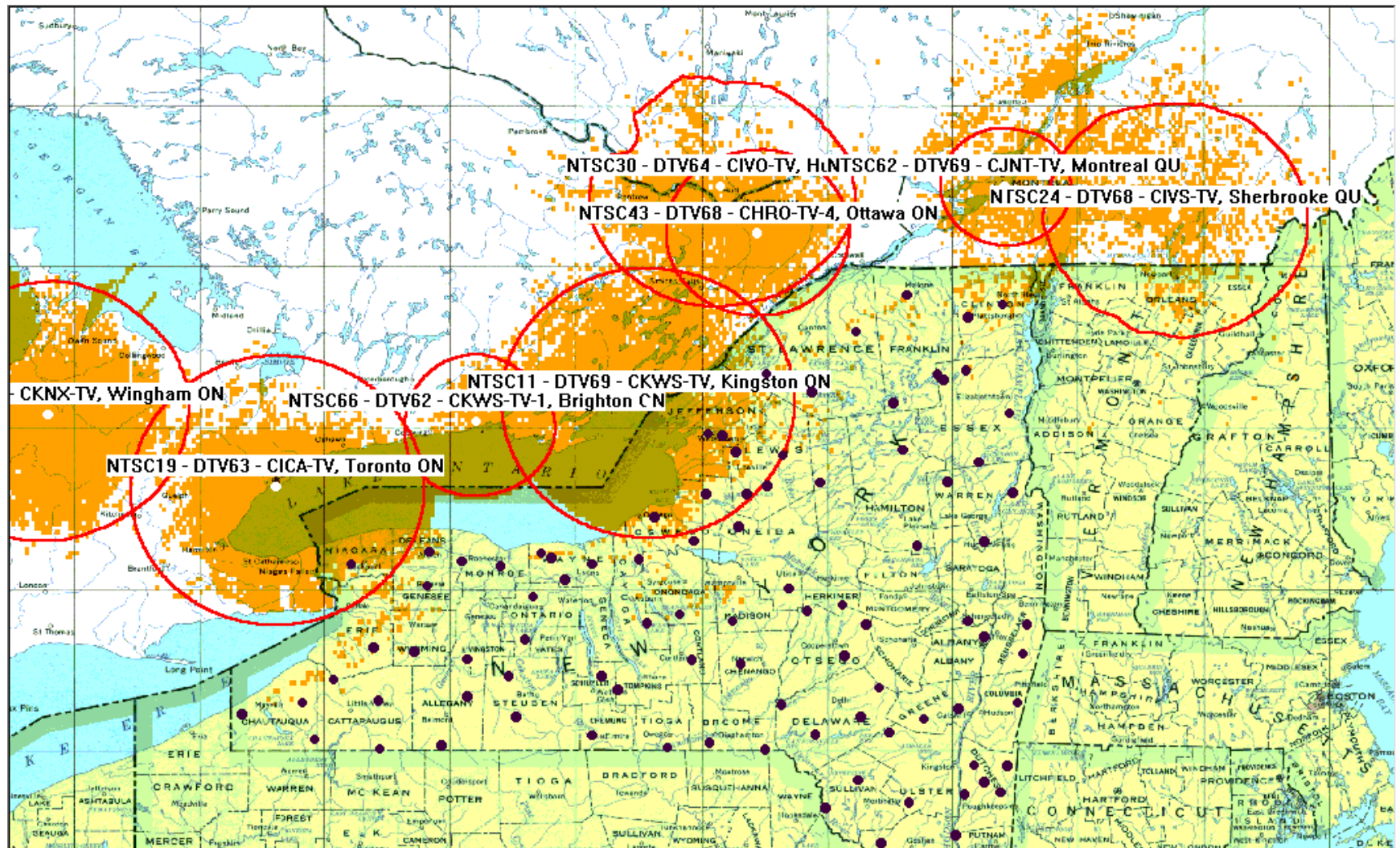
-121.4 dBm	Sensitivity at 5% BER
- 3.0 dB	Antenna gain
- (-23.8) dB	6 MHz to 25 kHz power reduction
- 3.6 dB	10% interference fade increase
- (-35.0) dB	<b><u>Close</u></b> sideband noise level
- <u>14.4 dB</u>	Co-channel interference rejection ratio *
- <b>83.6 dBm</b>	<b>Mobile Receive Interference Threshold</b>

\* (P interferer - P desired) dB - NTIA 99-358 Table 3.

The Co-channel interferer is the sideband noise of the adjacent channel DTV signal.

# Canadian DTV

**Close Adj-channel at Mobiles (2.2 m) -83.6 dBm**



# Power Thresholds

## DTV Adjacent channel at mobile receive, antenna 2.2 m above ground

-121.4 dBm	Sensitivity at 5% BER
- 3.0 dB	Antenna gain
- (-23.8) dB	6 MHz to 25 kHz power reduction
- 3.6 dB	10% interference fade increase
- (-55.0) dB	<b><u>Far</u></b> sideband noise level
- <u>14.4 dB</u>	Co-channel interference rejection ratio *
- <b>63.6 dBm</b>	<b>Mobile Receive Interference Threshold</b>

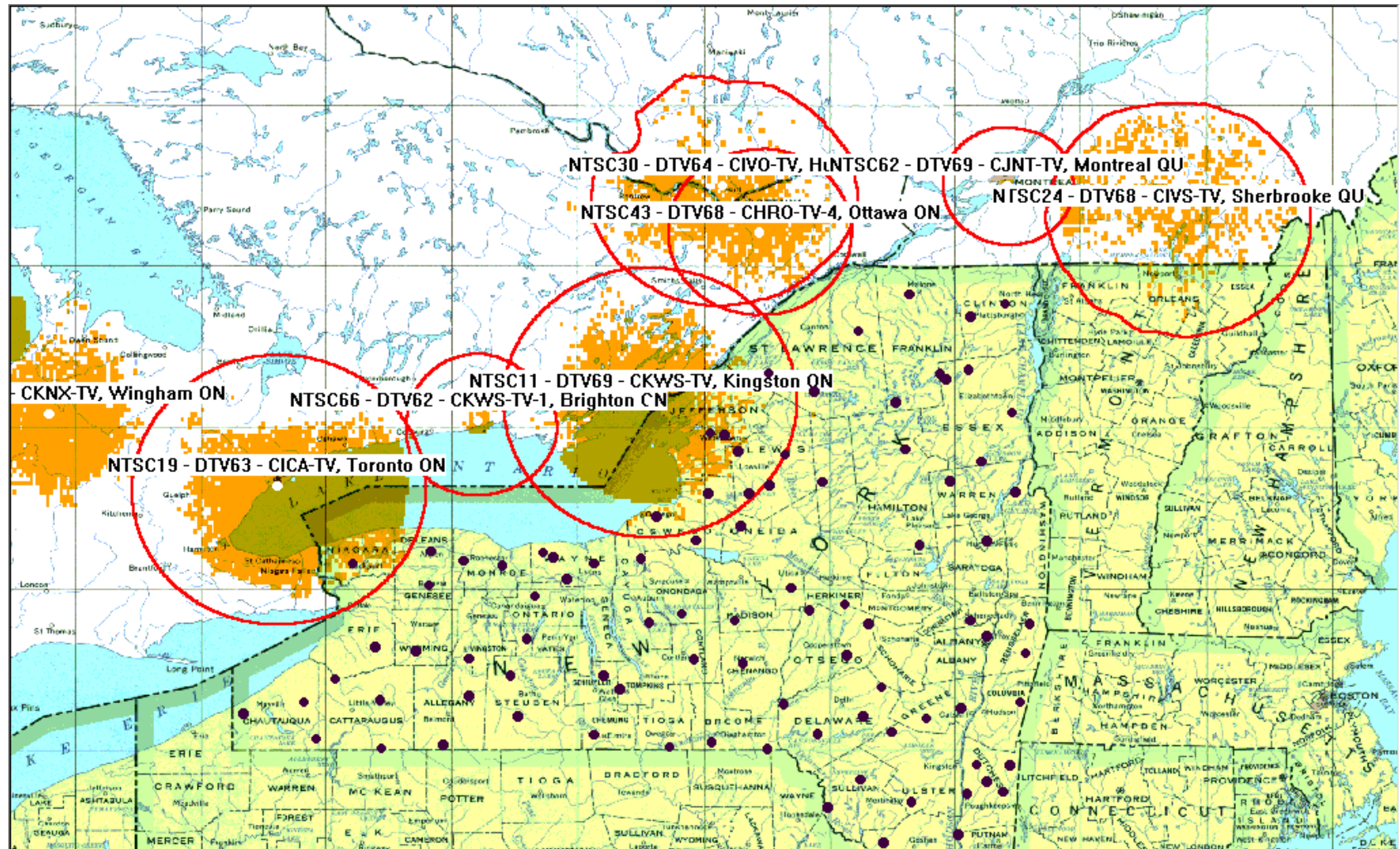
\* (P interferer - P desired) dB - NTIA 99-358 Table 3.

The Co-channel interferer is the sideband noise of the adjacent channel DTV signal.



# Canadian DTV

## Far Adj-channel at Mobiles (2.2 m) -63.6 dBm



# **MISCELLANEOUS ISSUES and CONCLUSION**

- **Over-water signal propagation anomalies (eg. ducting) have not been taken into consideration. This phenomenon can significantly extend the range of radio signal interference.**
- **Certain assumptions and approximations were used, inasmuch as New York State was interested in a 25 kHz 4-slot TDMA technology and data was not readily available at the time for those adjacent and co-channel interference characteristics. However, the numbers used herein are believed to be reasonable approximations.**
- **Time sensitivity created by current regulatory and international negotiation activities required that preliminary analyses be presented as soon as possible to heighten the awareness of appropriate agencies to the significant impact of these issues.**
- **Clearly it has been shown that the sensitivity of LMR receivers in realistic system implementations needs to be taken into consideration, or else the new U.S. Public Safety band at 764-776/794-806 MHz will be unusable along large portions of the U.S./Canadian border area.**